Claims

1. A method for controlling a treatment apparatus arrangement (3) in a treatment plant (1), the treatment plant is arranged to treat liquid comprising solid matter such as waste water, the treatment plant (1) comprising:

- a basin (2) housing a basin content constituted by a liquid comprising solid matter, the operating condition in said basin (2) being anoxic and/or anaerobic, and
- said treatment apparatus arrangement (3) that comprises:
  - at least one mixer machine (4) located in said basin (2), the mixer machine (4) having a treatment plant depending predetermined suspension speed adapted to keep solid matter suspended in the liquid, and
  - a variable speed drive (5) operatively connected to said mixer machine (4),

the method being **characterized** in that by means of the variable speed drive (5) operating the mixer machine (4) alternately in

- a Normal Operation Mode, in which an operational speed of the mixer machine (4) is controlled in real-time to be the highest of said suspension speed and a basin throughput rate depending process speed, said basin throughput rate being determined continuously and is based on at least a basin input, a basin output and adequate blending of the basin input and a basin content, said process speed is predetermined for each combination of different process load situations and different process criteria in the specific basin (2) to be as low as possible without adversely affecting the treatment results and still providing adequate mixing of the liquid comprising solid matter, wherein the process load is constituted by a hydraulic load and a waste load, and
- a Reduced Operation Mode, in which the operational speed of the mixer machine (4) is below said suspension speed.

2. The method according to claim 1, wherein the operational speed of the mixer machine (4) in the Reduced Operation Mode is below 10Hz, preferably equal to zero.

3. The method according to claim 1 or 2, wherein the process speed of the mixer machine (4) is proportional to the basin input.

4. The method according to any preceding claim, wherein the mixer machine (4) is operated in the Normal Operation Mode at least 5 minutes each turn, preferably at least 10 minutes.

5. The method according to any preceding claim, wherein the mixer machine (4) is operated in the Reduced Operation Mode at least 5 minutes each turn, preferably at least 10 minutes.

6. The method according to any preceding claim, wherein the treatment apparatus arrangement comprises at least two mixer machines (4), which are operated mutually independent of each other.

7. The method according to any preceding claims, wherein the basin (2) comprises at least one inlet (7) and at least one outlet (8) for liquid.

8. The method according to claim 7, wherein a basin input via said at least one inlet (7) and a basin output via said at least one outlet (8), respectively, are continuous.

9. A treatment apparatus arrangement for a treatment plant that is adapted to treat liquid comprising solid matter such as waste water, the treatment apparatus arrangement (3) comprising:

- at least one mixer machine (4) intended to be located in a basin (2) housing a basin content constituted by the liquid to be treated, the mixer machine (4) being arranged to be driven in a treatment plant depending predetermined

suspension speed adapted to keep solid matter suspended in said liquid, and

- a variable speed drive (5) operatively connected to said mixer machine (4),

the treatment apparatus arrangement being **characterized** in that the variable speed drive (5) is arranged to operate the mixer machine (4) alternately in

- a Normal Operation Mode, in which the operational speed of the mixer machine (4) is controlled in real-time to be the highest of said suspension speed and a basin throughput rate depending process speed, and

- a Reduced Operation Mode, in which the operational speed of the mixer machine (4) is below said suspension speed, the treatment apparatus arrangement (3) comprising means for continuous determination of said basin throughput rate, which is based on at least a basin input, a basin output and adequate blending of the basin input and a basin content, wherein said process speed is predetermined for each combination of different process load situations and different process criteria in the specific basin (2) to be as low as possible without adversely affecting the treatment results and still providing adequate mixing of the liquid comprising solid matter, wherein the process load is constituted by a hydraulic load and a waste load.

10. A treatment plant for treatment of liquid comprising solid matter such as waste water, the treatment plant (1) comprising:

- a basin (2) arranged to house a basin content constituted by liquid comprising solid matter, the operating condition in said basin (2) being anoxic and/or anaerobic, and

- a treatment apparatus arrangement (3) according to claim 9.

Claims

1. A method for controlling a treatment apparatus arrangement (3) in a treatment plant (1), the treatment plant being arranged to treat liquid comprising solid matter such as waste water, the treatment plant (1) comprising:
- a basin (2) housing a basin content constituted by a liquid comprising solid matter, the operating condition in said basin (2) being anoxic and/or anaerobic, and
- said treatment apparatus arrangement (3) that comprises:
    - at least one mixer machine (4) located in said basin (2), the mixer machine (4) having a treatment plant depending predetermined suspension speed adapted to keep solid matter suspended in the liquid, and
    - a variable speed drive (5) operatively connected to said mixer machine (4),

the method being **characterized** in that the variable speed drive (5) operates the mixer machine (4) alternately in
- a Normal Operation Mode, in which an operational speed of the mixer machine (4) is controlled in real-time to be the highest of said suspension speed and a basin throughput rate depending process speed, said basin throughput rate being determined continuously and is based on at least a basin input, a basin output and adequate blending of the basin input and a basin content, said process speed is predetermined for each combination of different process load situations and different process criteria in the specific basin (2) to be as low as possible without adversely affecting the treatment results and still providing adequate mixing of the liquid comprising solid matter, wherein the process load is constituted by a hydraulic load and a waste load, and
- a Reduced Operation Mode, in which the operational speed of the mixer machine (4) is below said suspension speed.

2. The method according to claim 1, wherein the operational speed of the mixer machine (4) in the Reduced Operation Mode is below 10Hz, preferably equal to zero.

3. The method according to claim 1 or 2, wherein the process speed of the mixer machine (4) is proportional to the basin input.

4. The method according to any preceding claim, wherein the mixer machine (4) is operated in the Normal Operation Mode at least 5 minutes each turn, preferably at least 10 minutes.

5. The method according to any preceding claim, wherein the mixer machine (4) is operated in the Reduced Operation Mode at least 5 minutes each turn, preferably at least 10 minutes.

6. The method according to any preceding claim, wherein the treatment apparatus arrangement comprises at least two mixer machines (4), which are operated mutually independent of each other.

7. The method according to any preceding claims, wherein the basin (2) comprises at least one inlet (7) and at least one outlet (8) for liquid.

8. The method according to claim 7, wherein a basin input via said at least one inlet (7) and a basin output via said at least one outlet (8), respectively, are continuous.